Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GERHARD KEUPER, KARL-HEINZ SENGER,
and ROLAND STOLLER

Appeal No. 96-4122
Application 08/077,419[1]

ON BRIEF

Before THOMAS, HAIRSTON, and LEE, Administrative Patent Judges.

LEE, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1-6 and 11. No claim has been allowed.

References relied on by the Examiner

Kawagoe et al. (Kawagoe)	4,827,416	May 02, 1989
Rapiejko et al. (Rapiejko)	5,001,647	Mar. 19, 1991
Shiraishi et al. (Shiraishi)	5,001,636	Mar. 19, 1991

[1] Application for patent filed June 15, 1993.

Chan et al. (Chan)	5,021,987	June 04, 1991
Kamimura et al. (Kamimura)	5,003,770	July 23, 1991
Adachi et al. (Adachi)	5,058,017	Oct. 15, 1991
Majeed	5,071,157	Dec. 10, 1991
Kii et al. (Kii)	5,085,458	Feb. 04, 1992

The Rejections on Appeal

Claims 1 and 11 stand rejected under 35 U.S.C. § 103 as being unpatentable over Majeed, Adachi, and Chan.

Claims 2 and 3 stand rejected under 35 U.S.C. § 103 as being unpatentable over Majeed, Adachi, Chan, Kii, and Rapiejko.

Claims 4 and 6 stand rejected under 35 U.S.C. § 103 as being unpatentable over Majeed, Adachi, Chan, Rapiejko, Kamimura, and Kawagoe.

Claim 5 stands rejected under 35 U.S.C. § 103 as being unpatentable over Majeed, Adachi, Chan, Kamimura, and Shiraishi.

The Invention

The invention is directed to a method and apparatus for controlling the chassis of a vehicle based on a road surface-fixed reference system that is dependent on corrections made to a plurality of first signals. The plurality of first

signals represent movements of the vehicle relative to an inertial reference system. Claim 1 is the sole method claim and claim 11 is the sole apparatus claim. The applicants have grouped claims 1 and 11 together for purposes of their arguments in this appeal.

> 1. A method of controlling a chassis of a vehicle, said vehicle including a chassis, a body, and a plurality of wheels, said method comprising the steps of:
>
> sensing a plurality of first signals representing movements of the vehicle relative to an inertial reference system;
>
> determining correction values for correcting said first signals, said correction values being dependent on a plurality of second signals which represent one of relative movements between a said body and a said plurality of wheels, longitudinal movements of a said vehicle, and transverse movements of a said vehicle;
>
> providing corrected first signals dependent on said correction values;
>
> determining movements of the vehicle relative to a road surface-fixed reference system dependent on said corrected first signals; and
>
> controlling the chassis dependent on said determined movements.
>
> 11. A system for controlling a chassis of a vehicle, said vehicle including a chassis, a body, and a plurality of wheels, said system comprising:

> a plurality of sensors providing first signals representing movements of the vehicle relative to an inertial reference system;
>
> means for correcting said first signals dependent on at least one correction value, said at least one correction value being dependent on a plurality of second signals which represent one of relative movements between a said body and a said plurality of wheels, longitudinal movements of a said vehicle, and transverse movements of a said vehicle; and
>
> means for determining movements of a said vehicle relative to a road surface-fixed reference system dependent on said corrected first signals; and
>
> means for controlling said chassis, dependent on said determined movements.

Opinion

We reverse the rejection of claims 1-6 and 11.

A reversal of any prior art rejection on appeal should not be construed as an affirmative indication that the appellant's claims are patentable over prior art. We address only the positions and rationale as set forth by the examiner and on which the examiner's rejection of the claims on appeal is based.

Claim 11 requires a plurality of sensors providing first signals representing movements of the vehicle relative to an

inertial reference system. Claim 1 recites a corresponding method step. Claim 11 requires a means for correcting the first signals, dependent on a correction value that is dependent on one of several factors. Claim 1 recites a corresponding method step. Claim 11 requires a means for determining movements of the vehicle relative to a road surface-fixed reference system dependent on the corrected first signals. Claim 1 recites a corresponding method step. Claim 11 requires a means for controlling the chassis of the vehicle, dependent on the determined movements. Claim 1 recites a corresponding step.

Both independent claims require that vehicle movement be determined relative to a road surface-fixed reference system, that the road surface-fixed reference system is dependent on corrections made to a set of first signals, and that the first signals represent movements of the vehicle relative to an inertial reference system. The examiner's treatment of these claim limitations is disjointed and missing key relationships.

What the examiner has done is (1) find in Majeed a vehicle chassis control system which uses an inertial reference system, (2) find in Adachi a vehicle chassis control

system which, according to the examiner, uses a road surface-fixed reference system as an addition to the pre-existing vehicle chassis control system, and then (3) conclude that it would have been obvious to one with ordinary skill in the art, based on Adachi, to add a step of determining vehicle movement relative to the road surface[-fixed] reference system "from the corrected vehicle movement signals as disclosed by Majeed" (answer, at page 4, lines 1-3).

The examiner's reasoning is largely disjointed, contains errors regarding the teachings from the prior art, and also ignores certain claim features.

First, we agree with the appellants that Adachi discloses only an inertial reference system and not a road surface-fixed reference system. See the last sentence in appellants' reply brief on page 1. It is evident that the reference by the appellants to an inertial reference system in the last sentence of the first paragraph on page 2 of the reply brief is a mistake and is intended to refer to a "road surface-fixed reference system" rather than to an "inertial reference system."

The appellants' specification reveals that an inertial reference system does not take into account inclination changes of the road surface, whereas a road surface-fixed reference system is without the effects of changes in the road surface. What the examiner regards as a road surface-fixed reference system in Adachi (column 3, lines 51-69; column 4, lines 38-63; column 5, lines 1-55) is one which detects attitude changes in the vehicle body, i.e., pitching and rolling due to a number of causes including bumps or holes on the road surface. Such a system does not remove the effects of changes in inclination of the road surface. We agree with the appellants that motion due to changes in road surface inclination cannot be equated with motion detected in a road surface-fixed reference system. The examiner has not properly applied the meaning of road surface-fixed reference system in the context of the appellants' specification. The examiner erroneously regards vehicle pitching or rolling due to road surface changes as motion in a road surface-fixed reference system. See Examiner's Answer at page 3, lines 17-23).

Moreover, even if we regard Adachi's attitude change detection as a road surface-fixed reference system, it is

independent of any other separate inertial reference system. According to the claimed invention, the road surface-fixed reference system must be "dependent" on corrected first signals which first signals represent movements of the vehicle relative to an inertial reference system. The examiner cites Chan as teaching the conversion from an inertial vehicle reference system to a road surface-fixed reference system. However, the objective of Chan is entirely different. As is stated in Chan's column 17, lines 27-38:

> Sensor data therefore includes the effects of any aircraft motion. To reduce the system false alarm rate to an acceptable level, potential threats must be tracked in an inertial coordinate system. Effects of aircraft motion must therefore be eliminated from the raw sensor data before tracking can be done. Three rate-integrating gyros located at the sensor and strapped down to the aircraft hull will be able to measure motion caused by aircraft maneuvers as well as motion caused by aircraft vibrations, flexure and turbulence.

Chan's teaching concerns aircrafts in flight, not wheeled vehicles which travel by frictional contact between wheels and the road surface. Road surface-fixed reference, in the context of the appellants' specification, has no meaningful significance in Chan. Chan also seeks to eliminate all effects of vehicle motion, not just those caused by changes in

road surface inclination. It cannot reasonably be said that the end result of the conversion taught by Chan are signals representing vehicle motion in a road-surface reference system. Even if we assume that Chan teaches conversion of signals representing vehicle motion from an inertial reference system to a road surface-fixed reference system, which in our view it does not, the examiner has not adequately explained how in light of that teaching one with ordinary skill in the art would have combined the disclosure of Majeed and Adachi to arrive at the appellants' claimed invention. The examiner concludes that "a person of ordinary skill in the art would have found it obvious to combine the teachings of Majeed, Adachi et al. and Chan et al." (Examiner's Answer at page 4). But that is not a sufficient analysis to support the rejection. Precisely how the combination is made to arrive at the appellants' claimed invention has not been set forth.

In the response section of the examiner's answer (page 8), the examiner states the following about Majeed:

> Majeed models vehicle motion by a mass-spring system (see Fig. 5). The system responds road surface condition inputs (see Col. 1, lines 31-32). It would include knowledge of the transverse and longitudinal inclinations of the road surface. The mass-spring indirectly reflects vehicle movements in

> the road surface reference. The spring-mass deflection would indicate road conditions such as road inclination, longitudinal and transverse conditions as known in the art.

The above-quoted passage further reflects the misplaced idea that detection of vehicle motion due to road surface condition equates to detecting motion in a road surface-fixed reference system. The examiner has not shown anything in Majeed which reasonably would have suggested eliminating the effects of road surface inclinations on detected vehicle motion. The examiner further stated (answer at pages 8-9):

> Even if Majeed and Adachi did not take road surface as a fixed reference, practitioners in the art would have found it obvious to refer road surface as a fixed reference, because the vehicle moves in that reference in order to control car driving comfortability.

The statement is mere conclusory and unsupported by factual evidence. Moreover, the appellants' do not simply claim reliance on a road surface-fixed reference. Instead, the road surface-fixed reference system must be dependent on corrected first signals, which first signals represent movement of the vehicle relative to an inertial reference system.

For the foregoing reasons, we do not sustain the rejection of claims 1 and 11 under 35 U.S.C. § 103 as being unpatentable over Majeed, Adachi, and Chan.

As for claims 2 and 3, each of which depends from claim 1, the examiner additionally applied Kii and Rapiejko to meet the specific claim features recited therein. However, as applied by the examiner, Kii and Rapiejko do not make up for the deficiencies of Majeed, Adachi, and Chan as already discussed above. Accordingly, the rejection of claims 2 and 3 under 35 U.S.C. § 103 as being unpatentable over Majeed, Adachi, Chan, Kii, and Rapiejko cannot be sustained.

As for claims 4 and 6, each of which depends indirectly from claims 3 and 1, respectively, the examiner additionally applied Kamimura and Kawagoe to meet the specific claim features recited therein. However, as applied by the examiner, Kamimura and Kawagoe do not make up for the deficiencies of Majeed, Adachi, Chan, and Rapiejko, as already discussed above. Accordingly, the rejection of claims 4 and 6 under 35 U.S.C. § 103 as being unpatentable over Majeed, Adachi, Chan, Rapiejko, Kamimura, and Kawagoe cannot be sustained. Furthermore, the examiner’s statement of the

necessary motivation to combine teachings is mere conclusory and the examiner has not specifically articulated just how the teachings from the references give rise to the appellants' claimed invention. Stating that it would have been obvious to combine the teachings of Majeed, Adachi, Chan, Rapiejko, Kamimura, and Kawagoe does not explain how these multiple references are combined to arrive at the appellants' claimed invention.

As for claim 5, which depends from claim 4, the examiner additionally applied Shiraishi to meet the specific claim features recited therein. However, as applied by the examiner, Shiraishi does not make up for the deficiencies of Majeed, Adachi, Chan, Rapiejko, Kamimura, and Kawagoe as already discussed above with respect to claims 4 and 6. Accordingly, the rejection of claim 5 under 35 U.S.C. § 103 as being unpatentable over Majeed, Adachi, Chan, Kamimura, and Shiraishi cannot be sustained.

Conclusion

The rejection of claims 1 and 11 as being unpatentable over Majeed, Adachi, and Chan is reversed.

The rejection of claims 2 and 3 as being unpatentable over Majeed, Adachi, Chan, Kii, and Rapiejko is reversed.

The rejection of claims 4 and 6 as being unpatentable over Majeed, Adachi, Chan, Rapiejko, Kamimura, and Kawagoe is reversed.

The rejection of claim 5 as being unpatentable over Majeed, Adachi, Chan, Kamimura, and Shiraishi is reversed.

REVERSED

JAMES D. THOMAS Administrative Patent Judge	)
KENNETH W. HAIRSTON Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
JAMESON LEE Administrative Patent Judge	)

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Anthony Niewyk
BAKER & DANIELS
111 East Wayne Street
Suite 800
Fort Wayne, IN 46802